WHAT IS CLAIMED:

1. A method of grinding an elongate object with a rotating grinding stone, comprising the steps:

- rotating the elongate object about a longitudinal axis;
- rotating the grinding stone against a surface of the elongate object at a substantially constant speed and measuring an input power to the grinding stone;
- computing a vector value of the surface eccentricity of the elongate object, from the input power to the grinding stone and from a position of the elongate object by using a mathematical method; and
- adjusting a position of the grinding stone relative to the surface of the elongate object using an oscillating positioning controller based on the computed vector value, so that the position of the grinding stone is oscillated in a direction perpendicular to the longitudinal axis in synchronization with the rotation of the elongate object.

2. The method according to claim 1 wherein computing in the mathematical method uses a mean vector value of the input power weighted with the components of the rotational vector of the elongate object.

3. The method according to claim 1 wherein in the adjusting step, the oscillating position controller adjusts the grinding stone along a sinusoidal path.

4. The method according to claim 1 wherein in the adjusting step, the grinding stone is oscillated over an entire length of the elongate object to obtain a substantially circular object having a substantially constant cross-section.

5. The method according to claim 1 wherein the input power is measured by measuring an input power of an electric motor rotating said grinding stone.

6. The method according to claim 5 wherein an input current is measured.